**Historic, archived document**

Do not assume content reflects current scientific knowledge, policies, or practices.

1
Ex64S
Cop.

VIRGIN ISLANDS AGRICULTURAL EXPERIMENT STATION
ST. CROIX, VIRGIN ISLANDS, U. S. A.

Under the supervision of the
UNITED STATES DEPARTMENT OF AGRICULTURE

# REPORT OF THE VIRGIN ISLANDS AGRICULTURAL EXPERIMENT STATION

## 1926

LIBRARY
AGRICULTURAL ...
DEPARTMENT OF AG...
AUG 1 1927

Issued April, 1927

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1927

LIBRARY
RECEIVED
★ OCT 16 1944 ★
U.S. Department of Agriculture

## VIRGIN ISLANDS AGRICULTURAL EXPERIMENT STATION, ST. CROIX

[Under the supervision of the Office of Experiment Stations, United States Department of Agriculture]

E. W. ALLEN, *Chief, Office of Experiment Stations*
WALTER H. EVANS, *Chief, Division of Insular Stations, Office of Experiment Stations*

### STATION STAFF

JOHN B. THOMPSON, *Director*
W. M. PERRY, *Horticulturist*
M. S. BAKER, *Agronomist*
FRANCISCO QUINONES, *Agricultural Assistant*[1]
A. BISSERUP, *Executive Assistant*

---

[1] Temporarily engaged for work on the island of St. Thomas.

VIRGIN ISLANDS AGRICULTURAL EXPERIMENT STATION
ST. CROIX, VIRGIN ISLANDS, U. S. A.

Under the supervision of the
UNITED STATES DEPARTMENT OF AGRICULTURE

Washington, D. C. April, 1927

# REPORT OF THE VIRGIN ISLANDS AGRICULTURAL EXPERIMENT STATION, 1926

## CONTENTS

| | Page |
|---|---|
| Report of the director | 1 |
| Station improvements | 2 |
| Animal husbandry | 2 |
| Sweet-potato work | 4 |
| Report of the horticulturist | 5 |
| Experiments with truck crops | 5 |
| Root crops | 8 |
| Miscellaneous work | 9 |
| Report of the horticulturist—Continued. | |
| Seed and plant distribution | 10 |
| Report of the agronomist | 10 |
| Sugar cane | 10 |
| Cotton | 13 |
| Work in St. Thomas | 13 |
| Meteorological observations | 17 |

## REPORT OF THE DIRECTOR

By J. B. Thompson

Work at the station during the year ended June 30, 1926, was chiefly along lines previously inaugurated, and results on the whole were satisfactory. The annual rainfall totaled 36.06 inches, which is 9.94 inches below normal and 20.07 inches less than the total precipitation for the preceding year. Much progress was made in the various branches of the station's activities notwithstanding adverse weather conditions.

In the animal husbandry division the young cattle from the States made good development and remained in thrifty condition. A number of calves were dropped by station cows which had been bred to a registered Milking Shorthorn bull, and milk and butterfat production records were kept. Trap-nest records were continued in a study of egg production in the native hen.

In the agronomy division two St. Croix sugar-cane seedlings of the 1922 series stood out prominently in a comparative test with 50 locally grown and introduced varieties as to yield of sucrose. The new seedlings give indication of producing under dry-weather conditions and are regarded as highly promising.

In the horticultural division the results with Bermuda onions continued to be so encouraging as to justify growing the crop on a small commercial scale. The joint products of the several onion growers approximated 700 crates, the greater number of which were marketed in New York. Under the leadership of the horticulturist, the Virgin Islands' Cooperative Bermuda Onion Growers' Association was organized with an enrollment of some 20 members.

The station, working through its agricultural assistant, is endeavoring to improve conditions in St. Thomas by disseminating agricultural information of value to the island and by encouraging the general use of improved farming methods. A farm-to-farm survey was made preparatory to conducting cooperative experiments with the farmers and introducing crops superior to those now grown. The agricultural assistant distributed limited quantities of seeds of economic plants to stimulate interest in planting and personally advised with planters regarding their various problems.

### STATION IMPROVEMENTS

A 15,000-gallon cistern was constructed near the station residence to receive the flow from near-by buildings in the lower yard during periods of protracted rains. This addition increases the water-storage capacity to approximately 280,000 gallons, which is ample for domestic needs, for the station herd of 60 to 75 head, and for use in plant breeding and propagation work. The station reservoir held a reserve of more than 100,000 gallons during the past dry season when the water supply of the island was at its lowest.

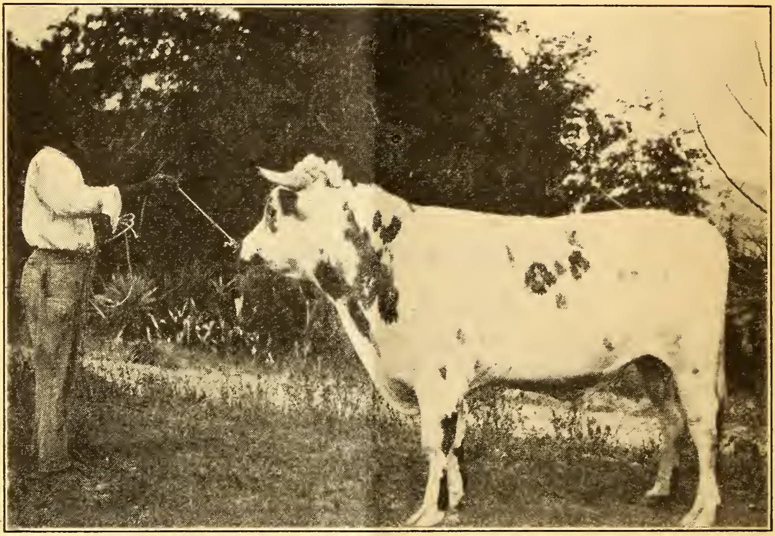

FIG. 1.—Milking Shorthorn bull, Government Clay Chief, 1257318. Purchased from Cornell University and brought to St. Croix as a small calf

Other improvements include an addition to the propagating house and to the poultry plant, and the erection of 320 rods of woven-wire fence.

## ANIMAL HUSBANDRY

### CATTLE

Satisfactory progress was made in cattle breeding. The Milking Shorthorn bull (fig. 1), imported from the States in January, 1924, as a small calf, developed very well, and a number of calves of his get were dropped in the station herd. Although this bull remains in good condition, he is noticeably affected by the heat of midday during the summer. His progeny, however, show no more inconvenience from the high temperature than do native animals of the same age. Two registered Guernsey heifer calves and a registered Guernsey bull calf (fig. 2), which were acquired at the close of the preceding fiscal year, made excellent growth. Some of the progeny of the grade Holstein bull, which was purchased several years ago from St. Kitts and kept in service at the station during the past two years, are approaching maturity. One of the two heifers of this breeding is making good milk records as compared with heifers of purely local blood lines. As a group, however, the progeny is not satisfactory. The calves are lacking in constitutional hardiness and are not able to withstand, like the true native calves, the adversities of dry weather when grazing is short.

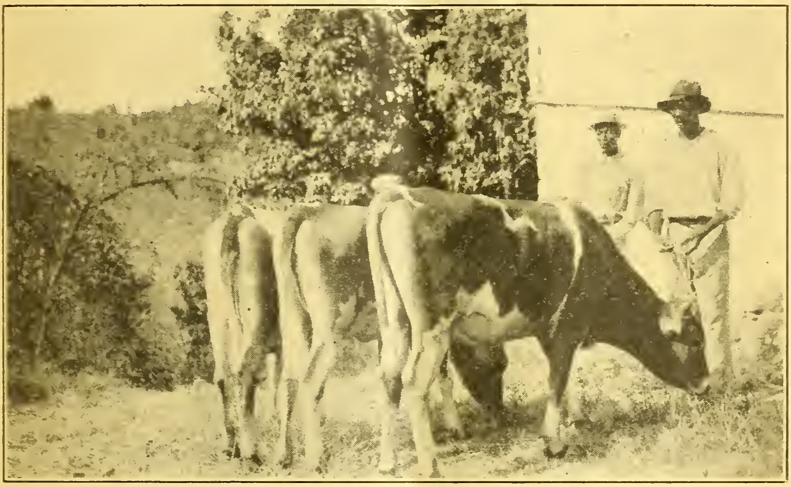

FIG. 2.—Purebred Guernsey calves. Right to left, bull Geneva's Justice, 113853, heifer Royal's Bess's Mavourneen, 186183, and heifer Royal's Ellen, 183163. Brought to St. Croix from Maryland as small calves in July, 1925.

All cows which were allowed to run with their calves and milked once a day were dropped from the dairy herd. Milk records were kept of young animals that were milked twice a day without the calf. Butterfat tests of the milk of individual cows are being made at regular intervals. Milk and butterfat yields for five heifers completing their first lactation period are given in Table 1.

TABLE 1.—*Comparison of milk and butterfat yield for first lactation of five native heifers*

| Cow | Lactation period | Total milk yield | Total butterfat yield |
|---|---|---|---|
| | *Days* | *Pounds* | *Pounds* |
| Alma | 365 | 4,165 | 222.4 |
| Blossom | 365 | 4,154 | 199.5 |
| Mary | 357 | 3,796 | 189.8 |
| Cherry | 365 | 3,293 | 151.4 |
| Lady | 365 | 2,270 | 113.3 |

The average yield of 411.2 gallons of milk is not from selected heifers, but from the first five and only native, tropical-bred heifers completing a yearly record in the Virgin Islands. Their feed consisted wholly of Guinea-grass pasturage.

## POULTRY

Trap-nest records of the station flock of native hens were continued. Eggs laid by Single Comb White Leghorns were hatched and the resulting chicks furnish the nucleus for a flock of the breed. The possibilities here for poultry raising are promising, at least for a limited number of poultrymen. The local egg supply comes largely from the small flocks of tenant farmers or laborers, who sell the eggs at 4 or 5 cents each from door to door. The demand for eggs is greater than the supply, and the dressed fowl can be marketed in San Juan, Porto Rico. Hens which are properly fed and well managed lay exceptionally well throughout the year. The islands are ideal for poultry raising, and offer many advantages over sections where the industry is highly specialized. At present most of the poultry feed used is imported, a practice that is not likely to be discontinued in the near future. Sorehead or chicken pox, epithelioma contagiosum, locally known as "yaws," is troublesome in some parts of the islands, but has not yet made its appearance in the station flock. The mongoose attacks young chickens which are given the freedom of unprotected range.

## SWEET-POTATO WORK

Sweet-potato breeding was continued. Approximately 800 seedling varieties were grown in the trial grounds, each number occupying 50-foot rows or $\frac{1}{217.8}$ of an acre. A light general yield resulted because of the setting in of an unusually dry period immediately following planting, but the comparative productivity of the individual numbers was not affected. Many successful crosses were made between different varieties. The progressive improvement of varieties by the process of blending desirable characters is retarded by the failure of many selected varieties to produce flowers, the sterility of the variety, or by its incompatibility with reference to desired combinations. The season of 1926 proved to be unfavorable to seed production and only a few scattering seed balls developed from natural field pollinations. In the work of effecting artificial crosses, a large number of the most desirable varieties were eliminated because of the immature appearance of their pollen grains. Only five varieties were used in the work of the season and four combinations made. Table 2 summarizes the results in the crossbreeding:

TABLE 2.—*Results of controlled pollination work with the sweet potato during 1926*

| Varieties | Pollinations effected | Seed balls obtained | Successful pollinations |
|---|---|---|---|
| | | | *Per cent* |
| No. 764×No. 942 | 25 | 7 | 28.0 |
| No. 912×No. 764 | 96 | 3 | 3.1 |
| No. 784×Black Rock | 110 | 6 | 5.5 |
| No. 764×Black Rock | 23 | 5 | 21.3 |
| Total | 254 | 21 | 8.27 |

Of the large number of seedling varieties of sweet potatoes that have been developed at the station during the past five years, only a few show indications of economic value. One of the most promising seedlings is station No. 426, which combines the desirable features of prolificacy and good table quality with attractive appearance.

During the year a bulletin dealing with the production of sweet-potato seedlings at the station was submitted for publication.[1]

## REPORT OF THE HORTICULTURIST

By W. M. Perry

### EXPERIMENTS WITH TRUCK CROPS

The horticulturist is doing everything possible to encourage the people to grow more and better vegetables, and has carried on much work of an experimental nature to show that by the use of good seed and proper cultural methods most of the vegetables of the Temperate Zone can be successfully raised in the Virgin Islands. During the year he prepared for publication a bulletin on gardening for popular and school use.[2]

#### COMMERCIAL PLANTINGS

As an outcome of the continued success with Bermuda onions, both at the station and in trial shipments to the markets of the mainland, local farmers are becoming interested in the commercial possibilities of the crop. During the year the Virgin Islands' Cooperative Bermuda Onion Growers' Association was organized under the leadership of the horticulturist, who also advised the growers how to plant, cultivate, and market their crop. The whole planting yielded approximately 700 crates. (Figs. 3 and 4.) Most of the seed arrived a month later than it was expected and the weather was exceptionally unfavorable for onion growing, but the general results were sufficiently encouraging to justify continuing the work another year. The first shipment of 220 crates went forward March 10, 1926, and brought prices ranging from $2.50 to $3.50 per crate in New York, with an average of $3.20 per crate. The cost of marketing was $1.29 per crate, which yielded a profit of $1.91 per crate. One plantation produced 300 crates of onions on a 2-acre plat, notwithstanding adverse conditions. As the season advanced and onions from Texas and elsewhere entered the market as competitors the price of Virgin Islands onions gradually declined. Results show, however, that, provided that seed is obtained and planted sufficiently early to mature the crop in March, Bermuda onions produced in the Virgin Islands can be marketed in New York when prices are usually high.

The marketing of Bermuda onions having proved so successful in New York in 1925, it was decided to make trial shipments also of eggplants, peppers, cucumbers, and tomatoes. Four separate consignments were sent forward between December and February and plainly indicated the possibility of getting these products on the northern market in good condition. Unfortunately, regular direct sailings from the Virgin Islands to New York are made at too long intervals to facilitate properly the movement of perishable products.

---

[1] Virgin Islands Sta. Bul. 5, Production of Sweet-Potato Seedlings at the Virgin Islands Experiment Station.

[2] Virgin Islands Sta. Bul. 6, Gardening in the Virgin Islands.

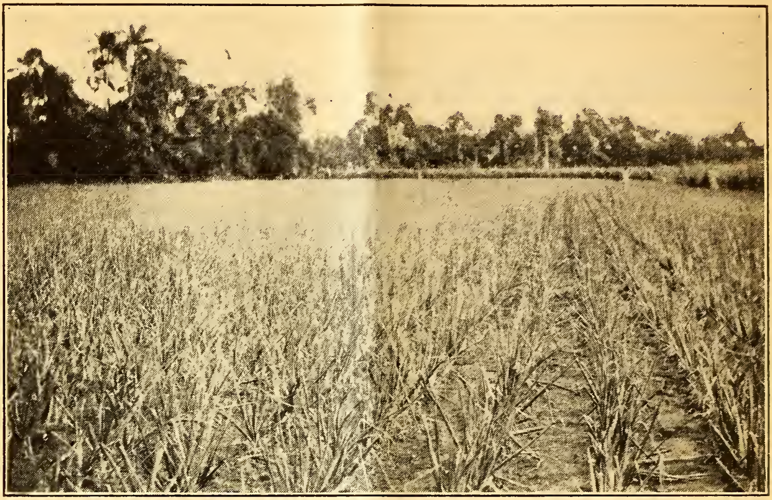

FIG. 3.—Field of Bermuda onions

A trial shipment was therefore made via Porto Rico, and the products reached New York in good condition. Vegetables going through Porto Rico are necessarily transshipped in San Juan, but good connections are made there weekly. The products were shipped in bushel boxes because standard crates were not available.

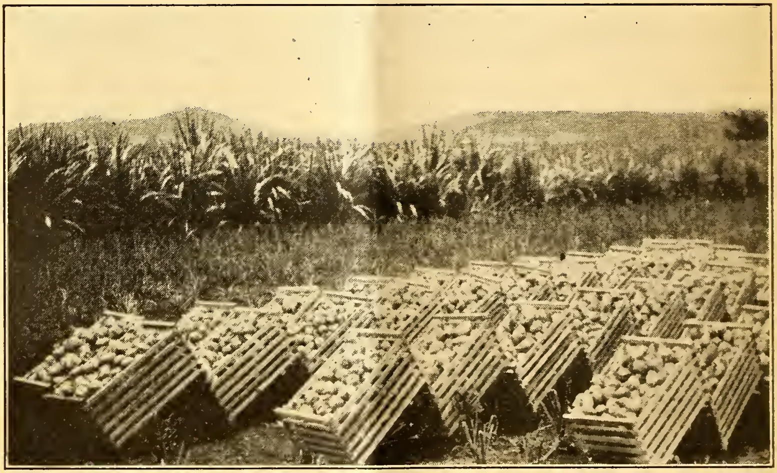

FIG. 4.—Bermuda onions sunning

The first consignment of 3 boxes of peppers, 1 box of eggplants, and 1 box of cucumbers left St. Croix December 7, 1925. The peppers brought an average price of $2.25 per box, the eggplants $1, and the cucumbers $6 per box. The total cost of marketing was $14.41. The next shipment was routed through Porto Rico on December 19, and arrived at New York on January 6. This shipment brought an average price of $2 for eggplants, $2.50 for peppers, and $6 for cucumbers. A box of tomatoes included in the shipment reached its destination in good condition, but the tomatoes were frozen while on the dock in New York. Another consignment of 6 boxes of eggplants, 5 boxes of peppers, and 2 boxes of tomatoes was made by steamer sailing direct to New York January 5. The eggplants brought an average price of $3 per box, the peppers $2.50, and the tomatoes $5. A balance of $29.61, or $2.28 per box, remained after deducting the marketing cost of $10.89 from the total sales receipts. The last consignment of 9 boxes of peppers and 3 boxes of tomatoes was made February 17 by direct sailing. The peppers brought an average price of $1.50 per box and the tomatoes, which were frozen on the New York dock, $1 per box.

The Large Purple Thornless variety of eggplant was used in all the trials at the station. This variety produced 1,708 pounds of fruit on a 1/13-acre plat, which is at the rate of 22,204 pounds per acre. However, Black Beauty proved to be the more prolific of these two varieties in previous tests at the station, and the fruits are somewhat similar. The Chinese Giant variety of pepper was shipped, but commission merchants advise that the bell type like the Ruby King is preferred by the New York trade. The Bonnie Best tomato is admirably adapted for shipping. It is a smooth, solid variety of medium size and colors uniformly while in transit. The variety yielded 887 pounds of fruit on a 1/36-acre plat. Under present shipping facilities, a large proportion of the tomato crop will become too mature for shipment before the departure of a New York bound vessel, but such fruit could be utilized in canning where the crop is grown on a commercial scale.

The cucumber is severely attacked by aphids and melon worms, and for this reason it is questionable whether the crop can be profitably grown for export trade. Various combinations of insecticides were tested to combat the pests. Applying Paris green and finely powdered lime in the proportion of 1 to 10 by means of a hand blower was found to be the simplest remedy for melon-worm control. (Fig. 5.) To combat both aphids and melon worms attacking the crop at the same time, a combination of arsenate of lead at the rate of 2 pounds and nicotine sulphate (1 pint of 40 per cent solution) to 50 gallons of water was used. The solution was applied with a barrel sprayer provided with a curved connection between the nozzle and the extension rod to facilitate underspraying the leaves. Dusting or spraying was necessary every third or fourth day to keep the pests under control.

### LIMA BEANS

Seed of the Florida butter bean from which the objectionable dark mottlings have been eliminated was planted September 9, 1925, and the resulting seedlings gave no indication of a throwback. In a comparative planting with the small white Lima (Carolina Sieva), the white Florida butter variety produced 4½ pounds more dried beans per 50-foot row.

### TOMATOES

Results from the third successive comparison of tomatoes from station-grown and imported seeds leads to the conclusion that it pays to import fresh seed for each planting. The Duke of York variety was eliminated from the test this year because the firm from which the seed was purchased in the past has ceased to list it. The remaining varieties, Bonnie Best, Ponderosa, Stone, and June Pink, showed an increase in both number and size of fruits from imported seed, whereas Chalk's Early Jewel alone showed an increase in yield from station-grown seed.

### ARTICHOKE

One plant of Globe artichokes which were planted in the fall of 1924 produced a head in May, 1926. The plants are vigorous growers and have been free from attack by insect and disease. They are seedlings and exhibit great variation in character of leaves, degree of prickliness, and habit of growth. It is hoped that a desirable type can be developed and perpetuated by asexual propagation.

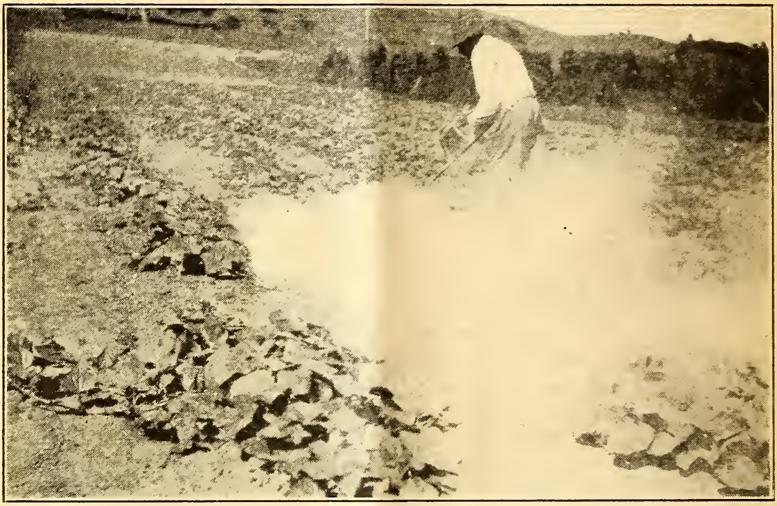

Fig. 5.—Dusting cucumbers with Paris green and lime

## ROOT CROPS

### ARROWROOT

Twenty-five hills were planted with Queensland arrowroot (*Canna edulis*), S. P. I. No. 46313, from rootstock divisions taken from the crop of last year. The planting was made on well-mulched, slightly elevated ridges, and the hills were spaced 3½ feet apart. The average yield per hill was 12.9 pounds.

### YAMS

Yam plantings again demonstrated the superiority of the Seal Top variety over the several varieties obtained last year from the

Porto Rico Agricultural Experiment Station at Mayaguez. One row containing 20 hills was planted March 11, 1925, to each of the varieties S. P. I. No. 47001, S. P. I. No. 31923, S. P. I. No. 34861, Ceylon, and Seal Top. The latter yielded 98 pounds of roots, whereas the other varieties yielded too poorly for recording. A plat of Potato yams yielded as high as 8.1 pounds of roots per hill.

## MISCELLANEOUS WORK

The fourth consecutive planting of Trucker's Favorite corn was made during the year. An effort is being made to acclimatize this variety by a yearly planting of selected seed from the previous crop.

Repeated efforts have been made to grow celery, but the results have been wholly of a negative character, owing largely to an absence of a sufficiently long period of cool weather. In a trial planting made in the lath-covered propagating house during the year, the plants grew tall, but the leafstalks were too spindling to be desirable for table use.

A plat of Mammoth Russian sunflower, planted October 10, 1925, made excellent growth and produced large heads, but the seed was light, chaffy, and valueless.

## ORCHARD WORK

Attempts to grow orchard fruit on the area first selected proved to be unsuccessful, and the work is therefore being transferred to a tract of land formerly devoted to vegetables. This tract is apparently well adapted to orchard work. Growing directly east of the tract and separating it from the arboretum is a windbreak of *Tecoma stans*, a large shrub locally known as Ginger Thomas. Figs of the Smyrna type have been planted on the new area and are making excellent growth. Plants of 5 strains of the caprifig and 10 varieties of avocado also have been planted for trial.

Orange bud wood of the varieties Valencia (*Hart's Late*), Lue (*Lu Gim Gong*), Washington Navel, and Ruby was received from the Porto Rico Agricultural Experiment Station at Mayaguez in September, 1925, and the buds were inserted in local sour-orange stock. The cane borer beetle destroyed a number of the buds, but several of each variety are making good growth. Five fruits were borne by one of the orange trees of the Indian River variety which were planted in 1923. The mulberry variety Townsend and species multicaulis are making rapid growth and the Townsend has produced some fruit. A grape of unknown origin which has been growing at the station for several years produced a small bunch of fruit and has been identified as the Alexandria (*Muscat of Alexandria*). The vine is a vigorous grower and has provided a number of cuttings for additional plants. Plants of the Munson varieties of grapes introduced some years ago have dwindled to nothing, indicating their lack of adaptability to island conditions. Cuttings of 27 different numbers of the pomegranate were received from the Bureau of Plant Industry of the United States Department of Agriculture and are being rooted. Some plants of a local variety of the fruit are bearing heavily. The pomegranate is highly prized among Virgin Islanders and the plants are valued as ornamentals.

### ARBORETUM

A driveway was made through the arboretum, leading from the outer border to a centrally located circle, and seedlings of the date variety Deglet Noor were planted on both sides of the drive. A banyan tree (*Ficus mysorensis*) was planted in the center of the circle with hibiscus and codiæums along the inner and outer borders of the drive around the circle. It is hoped that the arboretum may eventually become an attractive park. Plantings of additional species are made as they are received. Recent acquisitions include *Diospyros kaki*, *Sabinea carinalis*, *Spondogona salicifolia*, *Erythrina variegata*, *Cassia nodosa*, *Plumeria alba*, *Acacia scorpioides*, *Trichostigma octandra*, and *Sapindus saponaria*.

### SEED AND PLANT DISTRIBUTION

As a means of promoting interest in the more general planting of vegetables and of getting new and valuable economic plants in the hands of those willing to cultivate them, the station continued its policy of distributing fresh seeds and plants in limited quantities. Distribution during the year included 24,699 vegetable plants, 90 packets of vegetable seeds, 203 fruit plants, 12 ornamentals, castor bean seed (88 pounds), and yam tubers (24 pounds) of the variety Seal Top.

## REPORT OF THE AGRONOMIST

By M. S. Baker

### SUGAR CANE

Unfavorable weather again reduced the yield of sugar cane in St. Croix. The sugar output amounted to about half the quantity estimated early in the season. Rainfall, the limiting factor in cane production, was subnormal. The heaviest rains of the season fell during September and October and were followed by an abnormally dry period lasting through June. The rains fell in light showers and were rapidly evaporated. Mill reports indicate that the total sugar production for the 1925–26 season will amount to approximately 5,000 tons as compared with 10,000 tons for the 1924–25 season. From the same source it is learned that an average yield of 14 tons of plant cane and 6 tons of first ratoon cane per acre was obtained on the island. Analysis of the juice showed that it had an average sucrose content of 17.5 per cent.

### SEEDLINGS

Of the original 320 seedlings of the 1922 series, 27 remained in the test of 1926, and only two of these, SC 22/21 and SC 22/31, are promising. Both ranked well to the front among 49 varieties compared for yield of sucrose. Seedling SC 22/21 is the more drought resistant of the two canes, and therefore promises to be better suited to local conditions. It is an early maturing hard cane and is high in sucrose content. Seedling SC 22/21 is a green cane resembling its parent, SC 12/4.

A large number of new seedlings were grown during the year and 2,000 of them were transplanted to the field. Of the number set in the field 1,849 were grown from SC 12/4 arrows and the rest were seedlings of the Ribbon variety. A relatively large proportion of the SC 12/4 progeny is thrifty and making excellent growth, but the Ribbon seedlings are weak and unpromising.

In the work of germinating seedlings, the greatest success followed the planting of seed from arrows which were collected the last week in December and the first week in January. The following method gave the best results: Seed flats were partly filled with field soil that had been passed through a fine mesh screen. A sufficient portion of the light " fuzz " or seed from the arrow to cover the surface of the flat to a depth of one-fourth inch was placed in a container and thoroughly mixed with enough of the finely screened soil to cover the flat to a depth of one-fourth inch, had the soil been used alone. The soil and seed mixture was then uniformly spread over the surface of the flat and thoroughly watered. No additional covering of the seed was used. Seed when spread on the surface of the flat without any covering dries out too quickly, as does also seed that is covered with sand or a sand and soil mixture. A covering of field soil without the addition of sand shows a tendency to form a crust, while the seed packs from frequent waterings, and the resulting small seedlings do not thrive. The seedlings were grown in the open without shade.

## VARIETY TESTS

Trial plantings of 49 varieties of cane were made during the year to permit comparison of field characters, habits of growth, yields of cane, and sucrose content. The cane was grown between banks, the method of cultivation used approaching as nearly as possible that usually practiced locally. Table 3 gives the results of the 10 highest yielding varieties in the order of their merit.

TABLE 3.—*Comparison of yields obtained from 10 highest producing varieties of sugar cane grown in a test with 39 other varieties*

| Varieties | Cane per acre | Sucrose content [1] | Coefficient of purity | Sucrose per acre |
|---|---|---|---|---|
| | *Tons* | *Per cent* | | *Pounds* |
| B 376 | 23.32 | 20.65 | 95.16 | 4,430.32 |
| BH 10 (12) | 17.73 | 22.50 | 90.72 | 3,670.52 |
| SC 22/31 | 17.16 | 21.70 | 91.17 | 2,904.40 |
| B 6032 | 17.34 | 19.50 | 89.04 | 2,839.64 |
| D 116 | 20.37 | 16.70 | 81.46 | 2,789.74 |
| POJ 797 | 20.41 | 16.60 | 79.80 | 2,711.24 |
| SC 22/21 | 20.24 | 19.40 | 91.94 | 2,670.06 |
| POJ 228 | 17.23 | 18.50 | 85.64 | 2,549.92 |
| POJ 826 | 16.95 | 17.45 | 86.81 | 2,366.40 |
| Ba 7924 | 12.40 | 18.35 | 89.95 | 2,328.73 |

[1] The small laboratory mill extracted only about 40.7 per cent of the weight of the cane in juice. A modern factory mill would do much more efficient work. At the Danish West Indies Sugar Factory Co. the average juice extraction for the last 10 years has equalled 70.36 per cent of the weight of the cane.

All canes were harvested when Crystallina and Ribbon, the standard local varieties, reached the proper stage of maturity. It is obvious that this method must work a distinct disadvantage in the cases of very early or very late maturing canes. A special study is to be made of the relative periods of maturity of some of the more promising varieties of cane.

## CULTURAL EXPERIMENTS

The experiment begun in November, 1923, to determine the effect of paper mulch on soil moisture was continued. Three grades of paper closely resembling building paper are being compared. The use of a paper mulch has been found to promote tillering and increase plant growth, but a comparison of the increase in cost of production with the value of the increase in yield indicates that the practice is hardly to be recommended for the Virgin Islands. The work is being continued with some modifications.

A test was begun on four 0.62-acre plats to learn the effect on yield of preparing cane land several months in advance of the planting season. Two alternate plats were plowed and harrowed in February, 1924, and also cultivated at intervals to control weed growth and maintain good tilth. The other plats were not prepared until time for planting in November, 1924. All plats were planted with the variety Crystallina and accurate records of labor costs and yields were kept. Table 4 gives the results of the test.

TABLE 4.—*Comparison of yields and sugar content of cane grown under different methods of culture*

| Plat number. | Treatment of plat | Cane per acre | Analysis of juice | | |
|---|---|---|---|---|---|
| | | | Brix reading | Sucrose | Coefficient of purity |
| | | *Tons* | *Degrees* | *Per cent* | |
| 1 | Fallowed | 15.096 | 20.08 | 18.60 | 92.65 |
| 2 | Nonfallowed | 10.451 | 20.60 | 18.81 | 91.24 |
| 3 | Fallowed | 14.620 | 20.80 | 18.49 | 89.59 |
| 4 | Nonfallowed | 8.428 | 20.50 | 18.52 | 90.31 |

The results would seem greatly to favor early and thorough preparation of cane lands. Under this method the cost of production on a given area was approximately 7 per cent greater than on an equal area remaining unplowed until planting time. The cost is a small matter, however, in comparison with the increase of over 57 per cent in yield of cane. Growing leguminous cover crops during the time between harvesting and planting usually is not feasible because of the extremely dry weather prevailing then.

The belief is rather general in the Virgin Islands that the germinating qualities of sugar cane decline as the crop approaches maturity. Since the sugar content increases as the cane matures chemical tests might possibly be used to indicate the condition or period in which canes are the most suitable for planting. The establishment in this way of some line of demarcation between " seed " of good and bad quality would be of practical value to local planters. Repeated tests of material in various stages of growth were made with the varieties Crystallina having a medium normal sucrose content, and SC 12/4 having a high normal content of sugar. The material was taken from a planting which was 9 months old when the work started in October, 1925, and 16 months old when it was temporarily discontinued in May, 1926. Tests were made once monthly. A stool of each variety was divided into three groups consisting of (1) the most mature canes, (2) intermediate canes, and (3) the least mature canes. A part of each group was subjected to a germination test and the rest was used for analytical purposes. The results were inconclusive and the project is being carried over another year.

A comparison of results from planting on level land and in furrows between banks showed an advantage in yield for the first-named method. This statement is based solely upon results from the plant-cane crop, figures for ratoon cane not yet being available. The flat-land or level method of planting is being increasingly adopted by local planters. The labor shortage is constantly becoming more acute and level land planting permits horse cultivation and lessens the need of hand labor. Cuttings that were laid horizontally in furrows and covered with soil gave better results than those planted obliquely in holes made with a pickax or crowbar.

Spacing tests were conducted to learn the effect on yield of planting at different distances. The rows were spaced 3 to 5 feet apart and the plants 2 to 3 feet in the row. The results of the first year were in favor of close planting, the highest yields being made where the plants were set 2 feet apart in rows 3 feet apart.

Work is still in progress to determine the quantity of sugar lost when the period between cutting and milling of cane is prolonged.

### COTTON

Little interest was shown in cotton culture during the year because of pink bollworm infestation and an unstable market. Experimental plantings at the station were almost complete failures owing to the ravages of the bollworm. Every reasonable precaution was taken, including cleaning up in the field following harvesting, and fumigating and hand-picking cotton seed, but the measures proved to be ineffective. The cotton was grown on land that had borne an infested crop the year previous. Future work will be conducted on an area which has not been in cotton for several years.

## WORK IN ST. THOMAS

By Francisco Quinones

### BRIEF HISTORY OF THE ISLAND

The island of St. Thomas is approximately 12 miles long from east to west and 1 to 3 miles wide from north to south. In total area it is about 28 square miles. The surface contour is rough and hilly, with many outcropping rocks which greatly limit the use of modern farming machinery. This condition impedes extensive commercial plantings, as it involves the employment of much hand labor, but the soil is productive and vegetables and fruits in great variety can be grown successfully. The annual rainfall for the island is a little over 45 inches. With continuous warm weather and a high rate of evaporation the rainfall is not always adequate to produce optimum yields of many of the crops. St. Thomas is occasionally visited by hurricanes which greatly damage buildings and fruit trees and other farm crops.

In the past St. Thomas enjoyed a prosperity which was founded upon its commerce. The fine harbor and former customs laws and port regulations attracted the ships of all nations, and the island became an important distributing center for European merchandise destined to the various ports of South and Central America and to other points in the West Indies. The manufacture of rum, and bay rum from bay oil, and the coaling facilities of the port brought in many other vessels. The islanders gradually came to rely upon the harbor for support, the more successful men becoming traders and merchants and the laboring class finding steady and remunerative employment as stevedores or in handling cargo and coaling vessels.

Attempts had been made in the early days to develop agriculture, especially tobacco, cotton, and sugar cane, and during the early colonial period tobacco was used as a medium of exchange in the purchase of European merchandise. The sugar industry flourished through a long period of years and reached its zenith in 1796, when 2,496 acres were put under cultivation and 650 tons of sugar were produced. The growth of shipping resulted in an abandonment of the early industries, however, and a waning interest in agriculture. The commercial importance of the island declined with the outbreak of the World War in 1914, and prosperity was not restored upon the cessation of hostilities and the readjustment of world commerce. The tendency of ocean liners to utilize oil instead of coal for fuel deprives the island of another important source of income. As an outcome of the various economic changes of the past 12 years the people are again turning toward the farm and are taking probably more interest than ever before in agricultural pursuits, especially cattle raising and other industries having commercial possibilities.

## AGRICULTURAL SURVEY

Little definite information has been available concerning the agricultural situation and possibilities in St. Thomas. A farm-to-farm survey was made during the year for the purpose of gathering accurate data on some of the more important features of the island's agriculture. The agricultural assistant personally visited and inspected each estate and came in contact with practically every person engaged in any kind of farming. He discussed various farm problems with the planters and in many instances offered suggestions leading to the solution of the problems.

The results of the survey showed that over 100 owners of rural property have individual holdings ranging from 1 to 1,040 acres. Much of the land is owned in comparatively large tracts, 16 owners, including individual persons, partnerships, and plantations, controlling an aggregate total of 9,758 acres, which is 56.2 per cent of all the urban and rural property. Very few landowners are actively engaged in the production of cultivated crops, although many are interested in cattle raising. Of 124 farmers growing cultivated crops in 1926, only 16 own their land and 108 are tenants. The prevailing custom is to rent land under a verbal agreement at about $1 [3] per month per acre. This method of obtaining possession is most unsatisfactory since a tenant may be dispossessed at any time, and it probably accounts for the failure of farmers to plant large numbers of fruit trees and other products requiring a long season of growth. Of the 124 persons devoting all or part of their time to the cultivation of crops, 51 are white, 60 are negroes, and 13 are people of mixed races. Of the white people, 4 are owners and 47 are tenants, and their joint area under cultivation totals a little over 111 acres. Of the negroes, 7 are owners and 53 are tenants. Their total area under cultivation is a little over 65 acres. Five of the people of mixed races are landowners and 8 are tenants, with a total of 15.75 acres under cultivation. The people classed as "white" mostly belong to a colony known locally as "chachas," and are of French extraction, having emigrated to the island from St. Bartholomew. They number about 600 persons and devote their time chiefly to fishing, basket and hat weaving, and to farming. That farm life appeals to them may be readily seen by the proportion of their number drawn to it. Forty-nine, which is undoubtedly a high percentage of the breadwinners, were engaged in farming. Since the total population of St. Thomas is about 8,000, and the number of gardeners, exclusive of chachas, is 75, the ratio of other farmers to chachas is about 1 to 16. In other words, there are about 16 chacha farmers to every farmer outside the French colony.

---

[3] Equivalent to 96 cents in United States currency.

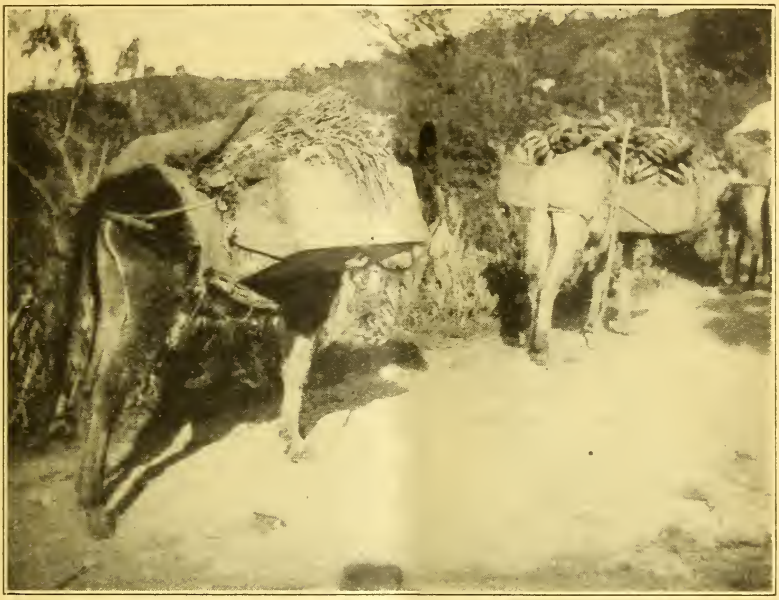

FIG. 6.—Transporting vegetables and fruits to market in St. Thomas

The major crops most frequently cultivated include bananas, tanias, sweet potatoes, pineapples, pigeon peas, yams, and cassava, and the minor crops, onions, tomatoes, eggplants, peppers, okra, turnips, cabbage, and lettuce. Many others could be successfully produced. The areas planted are very small. Ninety-nine plantings of bananas were found to occupy an area of $99\frac{3}{8}$ acres; 61 plantings of tanias, $25\frac{1}{16}$ acres; 57 plantings of sweet potatoes, $20\frac{5}{16}$ acres; 16 plantings of pineapples, $9\frac{1}{8}$ acres; 24 plantings of pigeon peas, $7\frac{7}{16}$ acres;

23 plantings of yams, 6¾ acres; and 17 plantings of cassava, 4⅜ acres. Forty-three plantings of minor crops occupied a total area of 20⅝ acres. The local demand for vegetables is limited, and the average grower supplements gardening with some other employment.

The greater number of the 8,000 inhabitants live in town. With the establishment of the naval station in 1917 the demand for garden products greatly increased, but the supply of fresh fruits and vegetables is erratic. A product may glut the market one day and sell at a good price later in the season when the local supply is exhausted. Cooperation among the farmers would help to regulate the supply and might make possible the profitable sale of surplus products in San Juan or other markets where the demand is greater than the supply. The lack of good roads leading from the rural districts to the town of St. Thomas is a serious obstacle to agricultural development. Some of the most fertile areas are wholly inaccessible by wheeled vehicles and the farm products can be carried to market only by pack animals. (Fig. 6.)

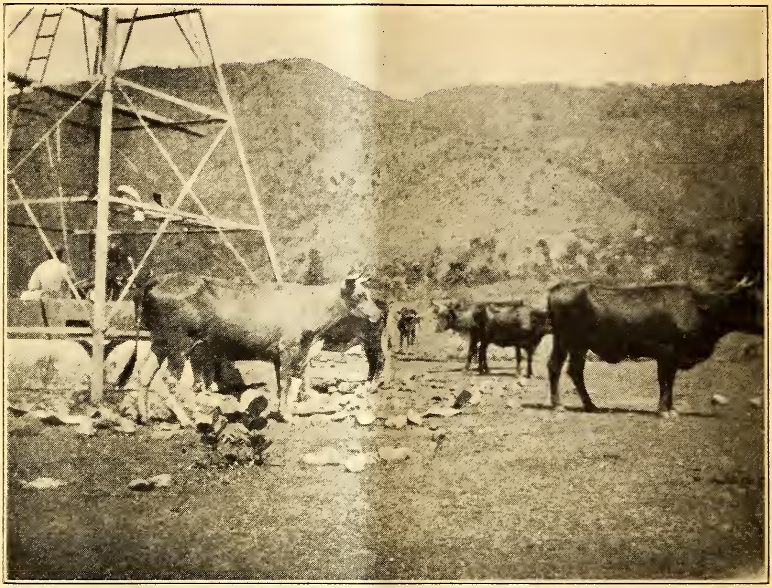

FIG. 7.—Type of cattle in St. Thomas

Conditions are favorable for cattle raising. (Fig. 7.) Owing to its rough, hilly contour, much of the island is not well adapted to growing crops requiring cultivation, but the land can be utilized for grazing. Guinea grass grows luxuriantly along the hillsides and is rich in palatable and nutritive qualities essential to animal production. Properly managed pastures are said to carry one and one-half head of cattle per acre the year round. Unfortunately, only a relatively small proportion of the grazing area is entirely clean of brush and the potential carrying capacity of the land is reduced accordingly. Pasture lands should not be continuously grazed. Pastures should be inclosed in a series of paddocks so that a given area can be closely grazed and then rested until the grass makes new growth. The cattle industry requires a minimum of paid labor and surplus animals are always in demand on the Porto Rico market. Milk retails throughout the year at 12 cents per quart and beef at 20 cents per pound. Within recent years considerable interest has been shown in the improvement of the herds, both by selection and through the importation of Ayrshire and Holstein bulls.

The poultry industry would seem to promise profitable returns to one thoroughly understanding it. Both fowls and eggs are in demand on the local market and also on the Porto Rico market. Chickens and eggs are frequently imported from the British islands of Tortola and Anegada. Chickens are in demand at 25 to 30 cents per pound live weight and eggs bring 4 to 6 cents apiece.

Two local apiarists have a total of 165 colonies of honeybees. These do well and under very favorable conditions produce as high as 240 pounds of honey per colony in a year.

Table 5 shows the number of domestic animals on St. Thomas in 1926 as compared with the number recorded in the census of 1917.

TABLE 5.—*Comparison of numbers of domestic animals on St. Thomas in 1917 and in 1926*

| Class of animals | Year 1917 | Year 1926 | Increase or decrease in 9-year period |
|---|---|---|---|
| | *Number* | *Number* | *Per cent* |
| Cattle | 2,127 | 2,380 | +11.9 |
| Goats and sheep | 662 | 690 | +4.2 |
| Mules and donkeys | 326 | 466 | +42.9 |
| Swine | 313 | 455 | +45.4 |
| Horses | 236 | 207 | −12.3 |

An increase in number is noted for most of the different classes of domestic animals during the period 1917–1926 notwithstanding the fact that the island population decreased about 20 per cent during this time. The increased use of the automobile undoubtedly accounts for the decline in number of horses. Mules and donkeys are used principally to transport charcoal and farm products to market and the increase in number of these animals would seem to indicate an increase in output of local farm products.

## METEOROLOGICAL OBSERVATIONS

By A. BISSERUP

The fiscal year 1926 was uneventful so far as hurricanes and unusual records of rainfall, temperature, and evaporation in the Virgin Islands are concerned. The total precipitation for the year was 36.06 inches, which is about 10 inches below normal and 20.07 inches less than for the preceding year. The heaviest rainfall for a 24-hour period, 3.34 inches, was recorded September 22, 1925. The absolute maximum temperature for the year, 91° F., occurred July 17, 29, and 30, and August 10, and September 1, 2, 6, 7, and 8, 1925, and June 11, 16, 17, 20, and 21, 1926. The absolute minimum temperature, 61° F., was recorded December 11, 1925, and March 4, 9, and 18, 1926. The hour of observation, 4.30 p. m., remained unchanged throughout the year. A barometer was installed during the year and is of value in forecasting approaching hurricanes. Innis Behagen, observer of the Weather Bureau, adjusted the instrument to suit the elevation and assigned it to a place on the office wall with its standard fixed at 30.1. Daily readings are recorded at 8.30 a. m., 12 o'clock noon, and again at 4 p. m. The lowest reading, 29.76, was observed on the mornings of May 11 and 12. Half an inch of rain fell May 11. Table 6 gives a summary of the meteorological data for the year.

TABLE 6.—*Condensed meteorological data for the fiscal year ended June 30, 1926*

| Month | Temperature | | Total rainfall | Average daily velocity of wind | Monthly evaporation |
|---|---|---|---|---|---|
| | Maximum | Minimum | | | |
| 1925 | °*F.* | °*F.* | *Inches* | *Miles* | *Inches* |
| July | 89.3 | 74.3 | 2.69 | 23.9 | 7.007 |
| August | 89.4 | 75.2 | 3.18 | 26.4 | 6.718 |
| September | 88.2 | 72.9 | 9.11 | 16.0 | 5.696 |
| October | 87.5 | 72.4 | 5.29 | 29.0 | 5.810 |
| November | 85.2 | 71.5 | 3.84 | 28.1 | 4.517 |
| December | 85.1 | 69.0 | 1.26 | 24.1 | 4.003 |
| 1926 | | | | | |
| January | 84.8 | 70.4 | 1.95 | 44.8 | 5.180 |
| February | 85.0 | 70.2 | 1.03 | 42.1 | 5.093 |
| March | 86.2 | 68.4 | 1.16 | 34.8 | 6.344 |
| April | 87.3 | 72.7 | 1.77 | 48.3 | 8.315 |
| May | 87.9 | 73.4 | 2.84 | 37.5 | 7.268 |
| June | 89.6 | 74.5 | 1.94 | 43.2 | 6.201 |
| Total | | | 36.06 | | 72.152 |

ADDITIONAL COPIES
OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.
AT
5 CENTS PER COPY
▽